
Austral Hepaticae. 28. *Plagiochila bazzanioides* Engel & Merrill, a Remarkable New Species of Plagiochilaceae from New Zealand

John J. Engel and G. L. Smith Merrill

Department of Botany, The Field Museum, Chicago, Illinois 60605-2496, U.S.A.

ABSTRACT. *Plagiochila bazzanioides*, a new species from New Zealand, is described and illustrated.

Plagiochila is the largest genus of hepatics, with perhaps as many as 1600 described species (Bonner, 1962). As in other species-rich groups, the actual number of species will probably prove to be considerably less. According to Schuster (1980: 348), "The total number of valid species of *Plagiochila* may prove to be below 500." The genus is widely distributed and essentially cosmopolitan. Centers of taxic diversity are chiefly in the Neotropics and southeast Asia, and the genus is rather poorly represented in temperate areas. For example, Schuster (1980) included 20 species for North America, and Inoue and Schuster (1971) included 25 species from temperate Australasia. This paper describes an additional distinctive species occurring in New Zealand, as follows.

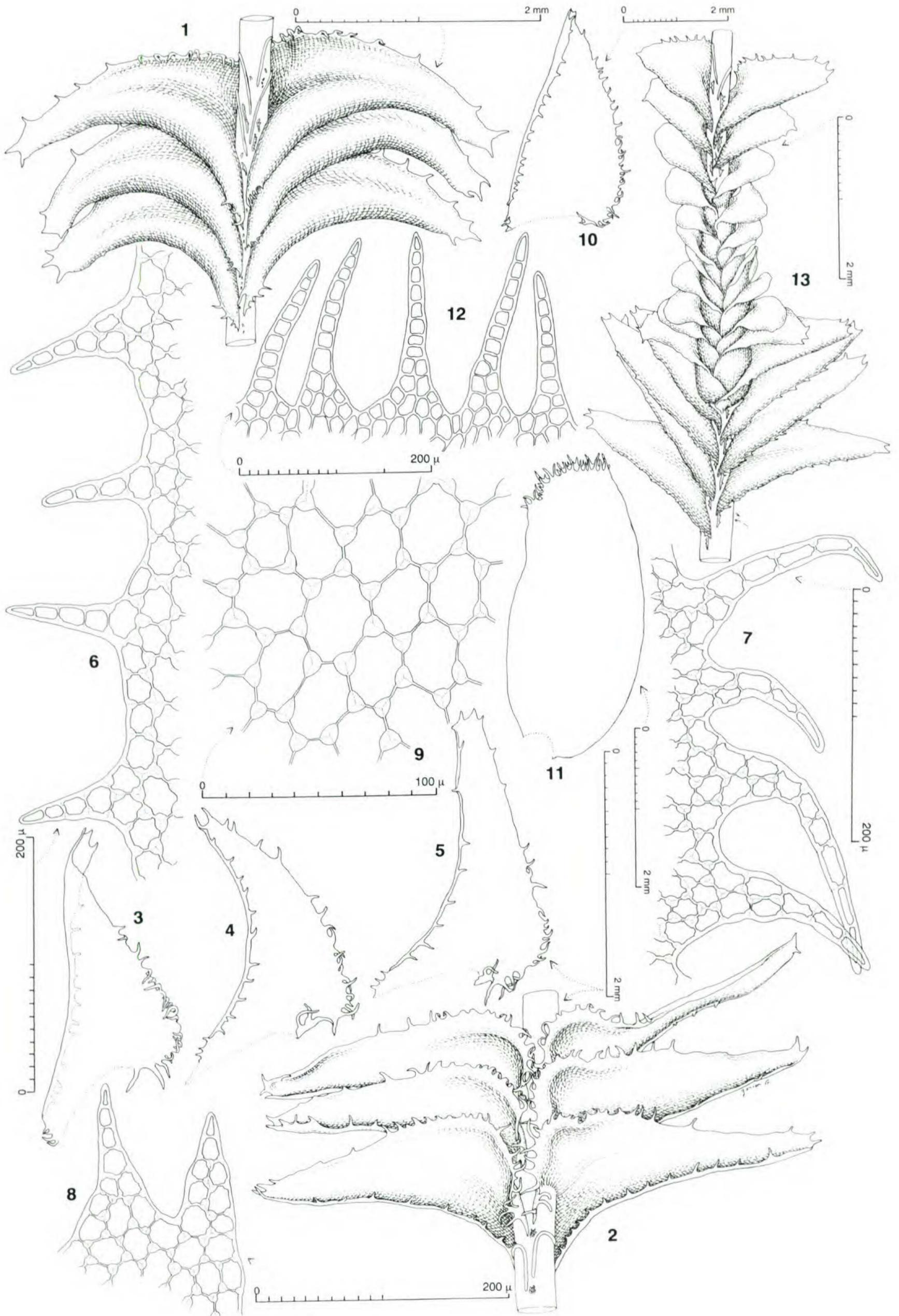
Plagiochila bazzanioides Engel & Merrill, sp. nov. TYPE: New Zealand. North Island: North Auckland Province, Rangitoto Island, immediately E of Auckland, 50–160 m, 4 Feb. 1995, Engel 20769 (holotype, F; isotype, CHR). Figure 1.

Species insignis foliis falcatis canaliculatis decurvatis, marginis foliorum pectinatis dentibus gracilibus uncinatis, ramis plurimis flagelliformibus, androeciis intercalaribus, paraphylliis caulibus dentatis lamelliformibus a species nobis notis optime distincta.

Plants bazzanioid in habit, ascending, without differentiation of a horizontal leafless axis, rich, deep olive green; leafy shoots medium, to 5 mm wide. Stems with paraphyllia inconspicuous, typically consisting of a single, short, sharply toothed lamella adjacent to dorsal leaf base; stem in cross section with cortical cells in (2)3 layers of very thick-walled cells, the medullary cell walls thin, colorless. Branching exclusively lateral-intercalary, sometimes with geotropic, microphyllous, rhizoidous, flagelliform, lateral-intercalary branches. Rhizoids rather dense on leafy shoots. Leaves horizontally spreading to ventrally secund, often con-

spicuously falcate, spreading at \pm right angles to stem, closely imbricate, frequently canaliculate-subtubular to the tips, the dorsal margins narrowly recurved and forming a distinct convex fold, lending the shoot a tightly pleated aspect in dorsal view, in ventral aspect the ventral margin aligned at right angles to the stem except for the basal sector, which lies parallel to the stem, in ventral view the ventral margins pectinate-toothed, the teeth often stiffly reflexed and hooked dorsally, the ventral surface of stem moderately or totally hidden; leaf insertion elongated, distinctly straight and steeply oblique for most of its length, abruptly recurved at ventral end; leaves asymmetrically narrowly elongate-trapezoidal, tapering to a markedly narrow, almost parallel-sided distal 0.2 to 0.3; leaf apex narrowly rounded to truncate, tending to become bidentate by 2 conspicuous, often diverging apical teeth that are often larger than adjacent teeth; dorsal margin nearly straight to broadly curved inward, with \pm regularly spaced, slender, recurved teeth to the base (best seen in ventral aspect); ventral margin \pm straight from a subauriculate base, conspicuously ciliate-dentate particularly in basal portion, the teeth stiffly reflexed (hooked dorsally), the margin often entire or subentire in the distal 0.5, decurrent, the decurrent strip dentate. Marginal teeth slenderly acuminate, 1–2 cells wide at the base, consisting almost entirely of a uniseriate row of 4–6 distinctly thick-walled cells, the terminal cell elongate, to 4.2:1. Underleaves consisting of an amorphous clump of cells, in part short-filamentous, at end of decurrent ventral leaf base. Cells in median portion of leaf thin-walled and with trigones bulging to knotlike; median cells 20–29 μm wide \times 30–36 μm long; cells of leaf bases scarcely elongated and not forming a basal field; cuticle smooth. Asexual reproduction lacking.

♂ Plants \pm smaller than the ♀ ones, mostly simple; androecia on main shoot and leading lateral-intercalary branches, becoming intercalary in position (often with several successive androecia occurring on a stem or branch); bracts many, in up to 15 pairs, strongly saccate in dorsal half of base; apex broadly rounded, spatulate, entire; ventral mar-



gin reflexed, entire or with a few spinose teeth near base; lobule large, the free margin very short, inflexed, slightly to moderately dilated, with a few minute teeth; antheridia 1 per bract, the stalk 2-seriate. Gynoecia at apices of main or leading shoots, usually with 1–2 innovations in absence of fertilization, the gynoecia with irregular, ciliiform-margined paraphyllia in dorsal sector of axil of innermost bracts; bracts of innermost series similar to leaves except somewhat larger and broader, narrowly ovate, with margins armed as in leaves. Perianth slightly inflated in basal sector but strongly bilaterally compressed above, the dorsal and ventral keels wingless; mouth truncate, with crowded, irregular, spinose teeth and cilia, the teeth 2–3 cells wide at the base and with a uniseriate row of up to 8 cells.

Sporophyte not seen.

Taxonomy. The dorsal surface of the stem in *Plagiochila bazzanioides* bears sharply toothed, lamelliform paraphyllia (Fig. 1: 1) as in *P. circumdentata* Stephani, and is assigned to *Plagiochila* sect. *Annotinae* Carl, together with that species, *P. annotina* Menzies ex Lindenbergh, and *P. baylisii* Inoue & Schuster, all of New Zealand (see Inoue & Schuster, 1971). The latter two species, however, lack stem paraphyllia. *Plagiochila circumdentata* has broadly ovate to deltoid-ovate leaves with a rounded, non-canaliculate apex and a strongly ampliate ventral margin. This species also differs in the position of androecia, often occurring on clusters of terminal, *Frullania*-type branches, whereas in *P. bazzanioides* the androecia are confined to the main shoot and leading lateral-intercalary branches, often becoming intercalary in position (Fig. 1: 13), with several successive androecia produced on a single shoot or branch.

The marginal teeth of the leaves of *Plagiochila bazzanioides* are unique among New Zealand species of the genus in being slender, stiffly hooked,

and claw-like (Fig. 1: 1–5), consisting almost entirely of a uniseriate row of up to 6 cells in length (Fig. 1: 7). The distinctly pectinate dorsal leaf margins resemble the teeth of a garden rake, and are apparent even under the dissecting microscope.

Plagiochila bazzanioides is notable for the remarkable *Bazzania*-like aspect of the plants, a combination of the ventrally decurved, falcate, narrowly channeled leaves with a truncate, few-toothed apex, and the frequent production of geotropic, flagelliform branches up to 2.5 cm long. Otherwise, in leaf shape and orientation *P. bazzanioides* resembles a slender *P. obscura* Colenso: both species have more or less attenuate, narrowly trapezoidal leaves. As in *P. obscura*, the leaf insertion is straight and steeply oblique for most of its length (Fig. 1: 1), and the ventral margin is straight and not ampliate, except for the short, truncate portion near the base, which in situ lies parallel with the stem (Fig. 1: 2). Also, as in *P. obscura*, the distal portion of the ventral margin is often entire, with the basal portion conspicuously armed with regularly spaced, slender, hooked teeth (Fig. 1: 2).

Distribution and ecology. Known only from Rangitoto Island (just east of Auckland) in forest primarily of *Metrosideros* that has developed over a lava flow. The species occurs at 50–160 m on thick soil over shaded rock, as well as festooning the sides of very protected, moist niches.

Paratype. NEW ZEALAND. **North Island:** same locality as type, Engel 20756–c. ♂ (F).

Literature Cited

- Bonner, C. E. B. 1962. Index Hepaticarum. Pars I. J. Cramer, Germany.
Inoue, H. & R. M. Schuster. 1971. A monograph of the New Zealand and Tasmanian Plagiochilaceae. J. Hattori Bot. Lab. 34: 1–225, f. 1–77.
Schuster, R. M. 1980. The Hepaticae and Anthocerotae of North America East of the Hundredth Meridian, Vol. 4. Columbia Univ. Press, New York.

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Figure 1. *Plagiochila bazzanioides* Engel & Merrill. —1. Sector of main shoot, dorsal view (note stem paraphyllia). —2. Sector of main shoot, ventral view (note rudimentary underleaves). —3–5. Leaves drawn to same scale (3 = dorsal aspect; 4, 5, ventral aspect). —6. Teeth of dorsal margin of leaf. —7. Teeth of ventral margin of leaf. —8. Leaf apex. —9. Median leaf cells. —10. Innermost ♀ bract (ventral aspect). —11. Perianth. —12. Portion of perianth mouth. —13. Sector of shoot with androecium. (Figs. 1–12, from holotype; Fig. 13, from Engel 20756, New Zealand, North Auckland Prov., Rangitoto Is., immediately east of Auckland.)